

In the Claims:

1-30. (Cancelled)

31. (Currently Amended) A method of measuring a force applied by a first member to a second member via a connecting body secured at a first location thereon to said first member, and at a second location thereon, spaced from said first location, to said second member, comprising:

transmitting a cyclically-repeating acoustical wave through a transmission channel in said connecting body from said first location thereon to said second location thereon;

measuring the transit time of said acoustical wave through said transmission channel from said first location to said second location;

and utilizing said measured transit time to produce a measurement of said force; ;

wherein said connecting body is a fastening plate which fastens said first member to said second member, and said first and second members are a first rotary member and a second rotary member fastened for rotation together about a common axis of rotation by said fastening plate, such that the force measured is the torque applied by said first rotary member to said second rotary member.

32. (Cancelled)

33. (Currently Amended) The method according to ~~Claim 32~~Claim 31, wherein said fastening plate is fixed at a first fixation point to said first rotary member, and at a second fixation point to said second rotary member; said transmission channel of the fastening plate being between said first and second fixation points such that said measured transit time of the cyclically-repeating energy wave represents a measurement of the strain of the fastening plate in said transmission channel between said first and second fixation points.

34. (Previously Presented) The method according to Claim 33, wherein said second fixation point is spaced from said first fixation point along a tangential line substantially perpendicular to a radial line from said first fixation point to said axis of rotation, such that the section of the fastening plate between said first and second

fixation points is deformed by being expanded or contracted, depending on the direction of rotation of said rotary members.

35. (Previously Presented) The method according to Claim 34, wherein said fastening plate is also fixed to said second rotary member at a third fixation point, said third fixation point being on said tangential line but on the opposite side of said first fixation point as said second fixation point, and being equally spaced from said first fixation point as said second fixation point, such as to produce, between said first and third fixation points, another transmission channel in the fastening plate which is deformed in the opposite sense as said first-mentioned transmission channel during the rotation of said drive shaft; said latter deformation also being measured and utilized to produce a measurement of said torque.

36. (Previously Presented) The method according to Claim 35, wherein said fastening plate is formed with a slot formation defining said first and second transmission channels in the fastening plate undergoing deformation during the rotation of the drive shaft.

37. (Currently Amended) The method according to ~~Claim 32~~Claim 31, wherein the two rotary members are coupled together by a plurality of said fastening plates equally spaced eccentrically around the axis of rotation of the rotary members.

38. (Currently Amended) The method according to ~~Claim 32~~Claim 31, wherein said first rotary member is a drive shaft of a vehicle, and said second rotary member is a driven shaft of the vehicle.

39. (Currently Amended) ~~The method according to Claim 31A method of measuring a force applied by a first member to a second member via a connecting body secured at a first location thereon to said first member, and at a second location thereon, spaced from said first location, to said second member, comprising:- transmitting a cyclically-repeating acoustical wave through a transmission channel in said connecting body from said first location thereon to said second location thereon;~~

measuring the transit time of said acoustical wave through said transmission channel from said first location to said second location;  
and utilizing said measured transit time to produce a measurement of said force;

wherein the transit time of said cyclically-repeating acoustical wave from said first location to said second location is measured by:

detecting a predetermined fiducial point in the cyclically-repeating acoustical wave received at said second location;

continuously changing the frequency of transmission of the cyclically-repeating acoustical wave in accordance with the detected fiducial point of each received wave such that the number of waves received is a whole integer;

and utilizing the measured change in frequency to produce a measurement of said transit time of the cyclically-repeating acoustical wave from said first location to said second location.

40. (Withdrawn) A method of measuring the torque applied by a drive shaft to a driven shaft along a common axis of rotation, comprising:

coupling said shafts together by fixing at least one torque sensor plate to one of said shafts at a first fixation point eccentric with respect to said common axis of rotation, and to the other one of said shafts at a second fixation point spaced from said first fixation point;

measuring the deformation of said torque sensor plate in a section thereof between said first and second fixation points;

and utilizing said measured deformation to produce a measurement of said torque;

said second fixation point being spaced from said first fixation point along a tangential line substantially perpendicular to a radial line from said first fixation point to said axis of rotation, such that the deformed section of the torque sensor plate between said first and second fixation points is expanded or contracted, depending on the direction of rotation of said drive shaft.

41. (Withdrawn) The method according to Claim 40, wherein said torque sensor plate is also fixed to said other one of said shafts at a third fixation point, said third fixation point being on said tangential line but on the opposite side of said first fixation point as said second fixation point, and being equally spaced from said first fixation point as said second fixation point such as to produce, between said first and third fixation points, another section of the torque sensor plate which is deformed in the opposite sense as said first-mentioned section during the rotation of said drive shaft; said latter deformation also being measured and utilized to produce a measurement of said torque.

42. (Withdrawn) The method according to Claim 40, wherein the two shafts are coupled together by a plurality of said torque sensor plates equally spaced eccentrically around the axis of rotation of the shafts.

43. (Withdrawn) The method according to Claim 40, wherein the deformation of said torque sensor plate in the section between said first and second fixation points is measured by:

transmitting a cyclically-repeating energy wave from one side of said section towards the other side of said section;

receiving the cyclically-repeating energy wave at the other side of said section;

detecting a predetermined fiducial point in the received cyclically-repeating energy wave;

continuously changing the frequency of transmission of the cyclically-repeating energy wave in accordance with the detected fiducial point of each received wave such that the number of waves received is a whole integer;

measuring the change in frequency; and

utilizing the measured change in frequency to produce a measurement of the deformation of the torque sensor plate in said section between said first and second fixation point, and thereby a measurement of said torque.

44. (Withdrawn) The method according to Claim 40, wherein said drive shaft is the output shaft of a vehicle engine.

45. (Currently Amended) Apparatus for measuring a force applied by a first member to a second member via a connecting body secured at a first location thereon to said first member, and at a second location thereon, spaced from said first location, to said second member, comprising:

a transmitter at said first location on said connecting body for transmitting a cyclically-repeating acoustical wave through a transmission channel in said connecting body to said second location thereon;

a receiver at said second location on said connecting body for receiving said cyclically-repeating acoustical wave;

and an electrical system for measuring the transit time of the cyclically-repeating acoustical wave through said transmission channel from said first location to said second location and for utilizing said measured transit time to produce a measurement of said force;

wherein said connecting body is a fastening plate which fastens said first member to said second member, and said first and second members are a first rotary member and a second rotary member fastened for rotation together about a common axis of rotation by said fastening plate, such that the force measured is the torque applied by said first rotary member to said second rotary member.

46. (Cancelled)

47. (Currently Amended) The apparatus according to Claim 46Claim 45, wherein said fastening plate is fixed at a first fixation point to said first rotary member, and at said second fixation point to said second rotary member; said transmission channel of the fastening plate being between said first and second fixation points such that said measured transit time of the cyclically-repeating energy wave represents a measurement of the strain of the fastening plate in said transmission channel between said first and second fixation points.

48. (Previously Presented) The apparatus according to Claim 17, wherein said second fixation point is spaced from said first fixation point along a tangential line substantially perpendicular to a radial line from said first fixation point to said axis of rotation, such that the deformed section of the fastening plate between said

first and second fixation points is expanded or contracted, depending on the direction of rotation of said rotary members.

49. (Previously Presented) The apparatus according to Claim 48, wherein said fastening plate is also fixed to said second rotary member at a third fixation point, said third fixation point being on said tangential line but on the opposite side of said first fixation point as said second fixation point, and being equally spaced from said first fixation point as said second fixation point, such as to produce, between said first and third fixation points, another transmission channel in the fastening plate which is deformed in the opposite sense as said first-mentioned transmission channel during the rotation of said drive shaft; said latter deformation also being measured and utilized to produce a measurement of said torque.

50. (Previously Presented) The apparatus according to Claim 49, wherein said fastening plate is formed with a slot formation defining said first and second transmission channels in the fastening plate undergoing deformation during the rotation of the drive shaft.